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Scientific Method – 9/6/05

The Scientific Method is a model or guide, used to solve problems.

Scientists do not have one scientific method. Every problem is different and needs to be solved in a different way. Scientists combine some or all of the science skills to solve different problems. They also use certain steps. The steps can be used in any order. You can write a laboratory report using these steps.

- I. **Identify and State the Problem** – Scientists often state the problem as question they are trying to answer. This is the title of your experiment.
- II. **State a Hypothesis** – An educated guess – a suggested solution to the problem - what you think will happen and why.
- III. **Design an Experiment** – to test your hypothesis
 - Materials Needed** – A list of items you need to complete the experiment.
 - Procedure** – A step by step list of everything you will do in your experiment.

- V. Make Observations, and Collect Data** - Carefully record everything you notice and measure. Use words, numbers, graphs, diagrams, charts, tables sketches and/or photos to describe and record your data.
- VI. Draw Conclusions** – Summarize and explain your data. How did your results compare to your hypothesis? Explain why you think your experiment turned out the way it did.
- VII. Identify the Implications** – How is this information usefull? Why we should care about these results? What does it all mean?
- VIII. Ask Further Questions** – What things do you wonder about as a result of this experiment? Where do you go from here?

Notes & Vocabulary – Lab Experiment

- A **control** is the part of the experiment that is not being tested and is used for comparison.
- A **variable** is any part of an experiment that can vary and affect the results of an experiment.
- An **independent variable** is the part of the experiment that is manipulated (changed) by the scientist performing the experiment.
- A **dependent variable** is the part of the experiment that is affected by the independent variable.
- A well designed experiment tests only one variable at a time.